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Complexation of copper(II) with ethylenediamine in an aqueous dioxane solvent

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Abstract

The spectrophotometric and pH-metric methods are used to study the complexation of copper(II) with ethylenediamine in aqueous dioxane (Xs = 0.17-0.48 mole fraction) solvent in the presence of NaClO4 (μ = 0.1 and 0.5). Starting from Xs = 0.17 mole fraction, the growth in the stability of the [CuEn]2+ and [CuEn2]2+ complexes becomes inconsistent with the dissolution factor because of the solvation processes in the system under consideration. Dioxane forms the solvate complexes with copper(II) through the inner-sphere coordination to the mono(ethylenediamine)copper(II) complex. In the bis(ethylenediamine)copper(II) complex, either the outer-sphere or simultaneous outer- and inner-sphere coordination of dioxane are most probable.